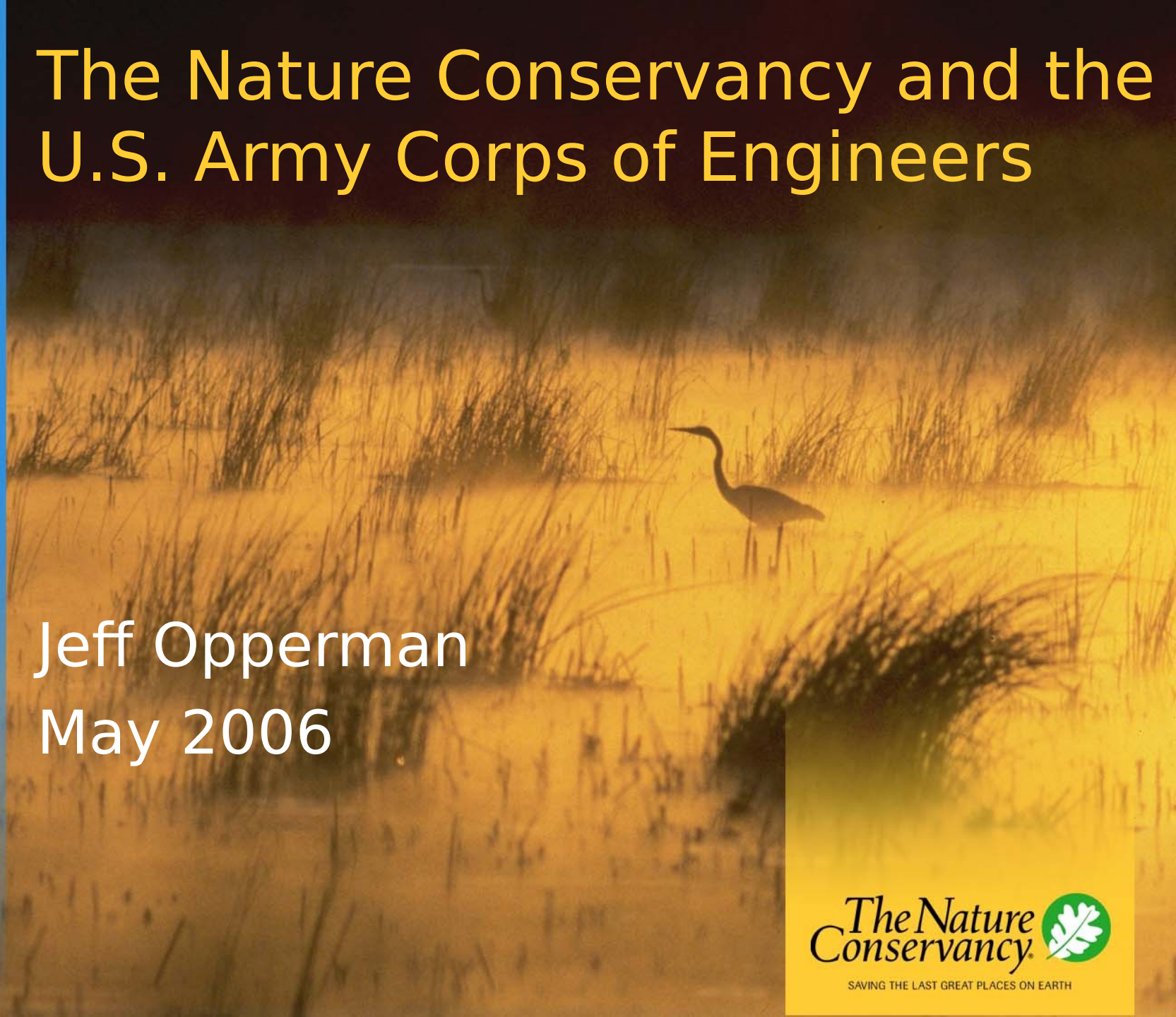
The Nature Conservancy and the U.S. Army Corps of Engineers



Jeff Opperman

May 2006

The Nature Conservancy

SAVING THE LAST GREAT PLACES ON EARTH

The Nature Conservancy's Mission

*To **preserve** the plants, animals, and natural communities that represent the **diversity of life on Earth** by protecting the lands and waters they need to survive.*

More than 50 Years...

- Largest conservation organization in the world
- Work throughout the western hemisphere and Asia/Pacific
- 117 million acres protected in 28 countries
- 1,300 + preserves
- Over 1 million members
- More than 3,200 employees

Guiding Principles

- Science-based
- Non-confrontational
- Community-based

➥ Cooperative, solution-oriented, with an emphasis on places, people and the future

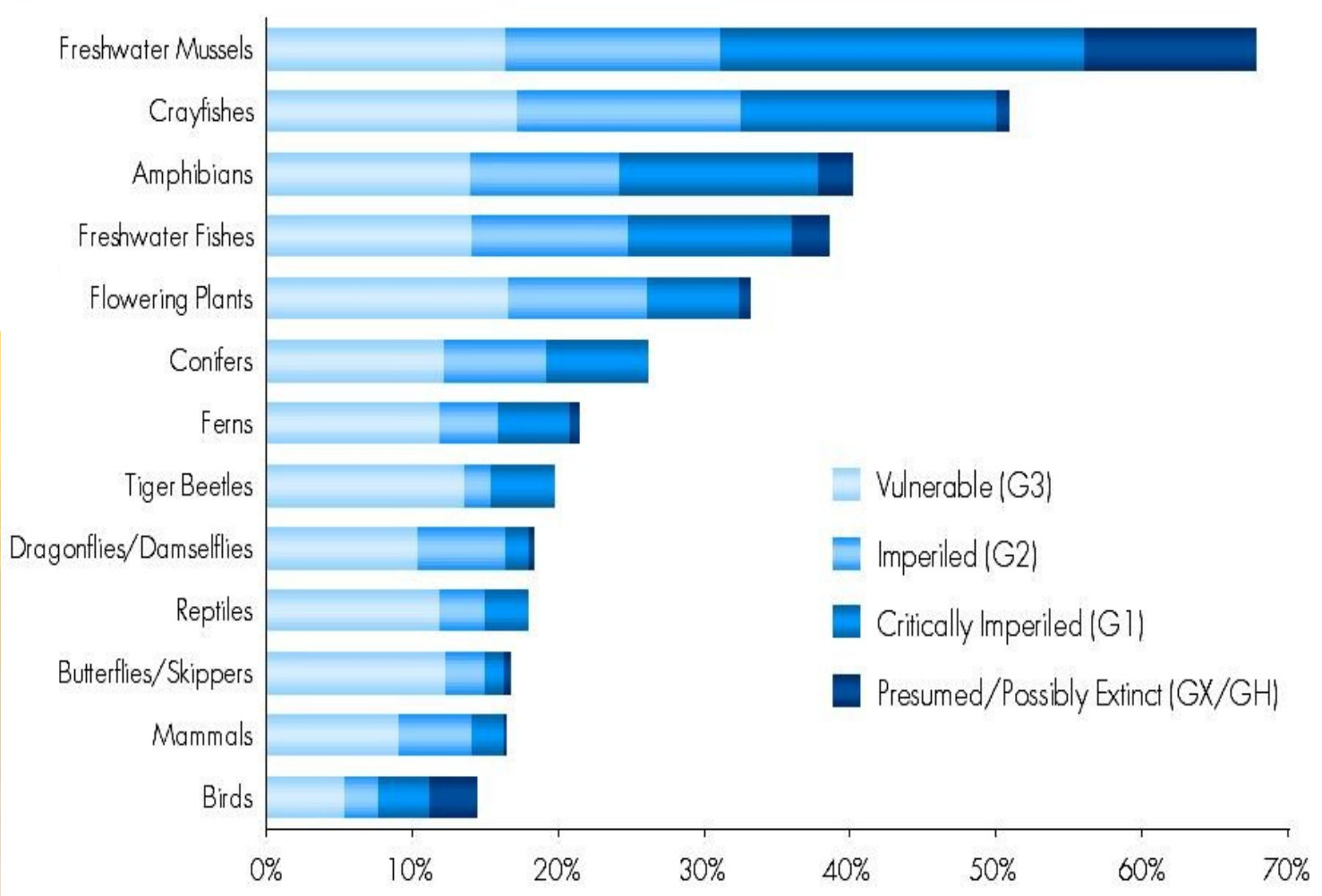
Army Corps of Engineers

Environmental Operating Principles

US Army Corps of Engineers

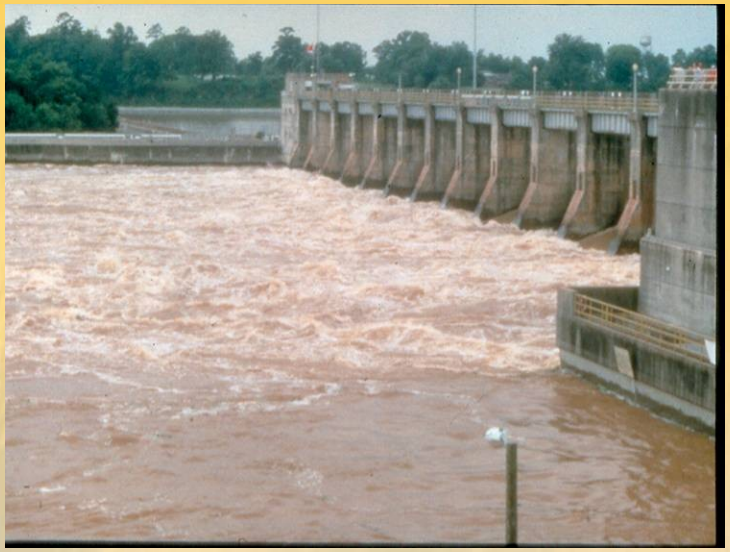
- Strive to achieve environmental accountability. *An environment maintained in a healthy, diverse, and sustainable condition* is necessary to support life.
- Recognize the interdependence of life and the physical environment.
- Proactively consider *environmental consequences of Corps programs* and act accordingly in all appropriate circumstances.
- Seek balance and synergy among human development activities and natural systems by *designing economic and environmental solutions* that support and reinforce one another.
- Continue to accept responsibility and accountability under the law for activities and decisions under our control that impact human health and welfare and the continued viability of natural systems.
- Seek ways and means to *assess and mitigate cumulative impacts* to the environment; bring systems approaches to the full life cycle of our processes and work.
- Build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work.
- Respect the views of individuals and groups interested in Corps activities, listen to them actively, and learn from their perspective in the search to *find innovative win-win solutions* to the Nation's problems that also protect and enhance the environment.

Proportion of U.S. Species at Risk



Impaired Freshwater Biodiversity…

Hydrologic Alteration



Water Quality

…in addition to invasive species & direct habitat destruction

Memorandum of Understanding

U.S. Army Corps of Engineers-The Nature Conservancy

Purpose…

…to facilitate effective and efficient management of important biological resources within the context of the Corps' civil works and regulatory missions

US Army Corps of Engineers®

The Nature Conservancy®

U.S. Army Corps of Engineers-The Nature Conservancy

Regional Agreements:

- ✓ Omaha District MOU with Nebraska Chapter 2003
- ✓ New York District MOU with Long Island Chapter 2004
- ✓ Mississippi Valley Division MOU with local TNC chapters 2004
- ✓ Southwest Division MOU with local TNC chapters 2004
- ✓ Omaha District MOU with Montana Chapter, US Fish & Wildlife Service, US Bureau of Reclamation, and State of Montana 2005
- ✓ North Atlantic Division MOU with local TNC chapters 2005
- ✓ SPD and local TNC Chapters initiating discussions on Regional MOU
- ✓ NWD express cal TNC chapters 2005

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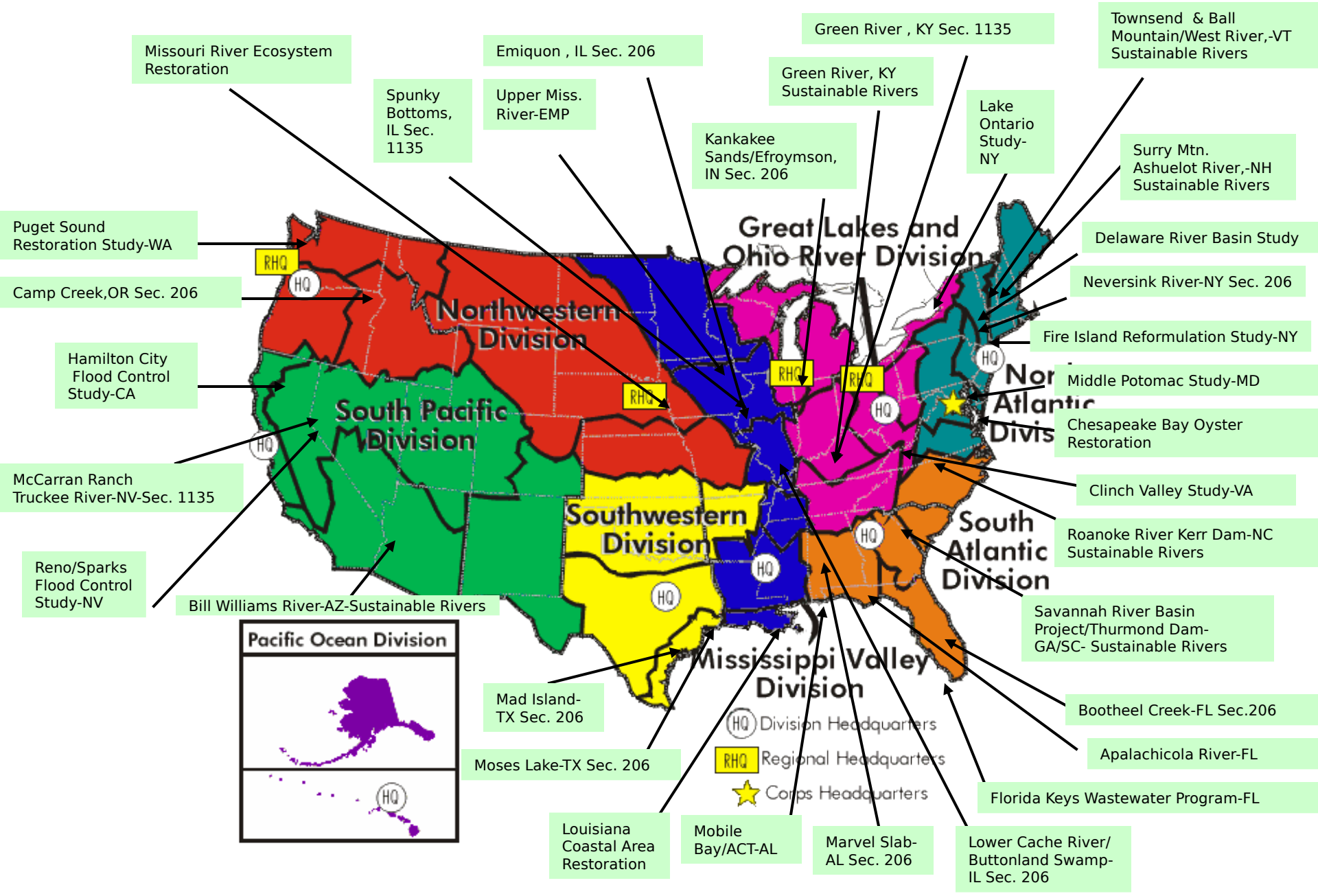
SAVING THE LAST GREAT PLACES ON EARTH

The Nature Conservancy…

…is the Corps' ***largest non-federal cost share partner*** on ecosystem restoration projects

The Nature Conservancy/Army Corps Partnership Sites


Missouri River Ecosystem Restoration
Emiquon , IL Sec. 206
Green River , KY Sec. 1135
Townsend & Ball Mountain/West River,-VT Sustainable Rivers
Spunky Bottoms, IL Sec. 1135
Upper Miss. River-EMP
Green River, KY Sustainable Rivers
Kankakee Sands/Efroymson, IN Sec. 206
Lake Ontario Study-NY
Surry Mtn. Ashuelot River,-NH Sustainable Rivers
Puget Sound Restoration Study-WA
Great Lakes and Ohio River Division
Delaware River Basin Study
Camp Creek,OR Sec. 206
Northwestern Division
Neversink River-NY Sec. 206
Fire Island Reformulation Study-NY
Hamilton City Flood Control Study-CA
South Pacific Division
Middle Potomac Study-MD
Chesapeake Bay Oyster Restoration
McCarran Ranch Truckee River-NV-Sec. 1135
Clinch Valley Study-VA
Southwestern Division
South Atlantic Division
Roanoke River Kerr Dam-NC Sustainable Rivers
Reno/Sparks Flood Control Study-NV
Bill Williams River-AZ-Sustainable Rivers
Savannah River Basin Project/Thurmond Dam-GA/SC- Sustainable Rivers
Pacific Ocean Division
Mississippi Valley Division
Mad Island-TX Sec. 206
Bootheel Creek-FL Sec.206
Division Headquarters
Regional Headquarters
Corps Headquarters
Moses Lake-TX Sec. 206
Apalachicola River-FL
Florida Keys Wastewater Program-FL
Louisiana Coastal Area Restoration
Mobile Bay/ACT-AL
Marvel Slab-AL Sec. 206
Lower Cache River/ Buttonland Swamp-IL Sec. 206

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Sustainable Rivers Project

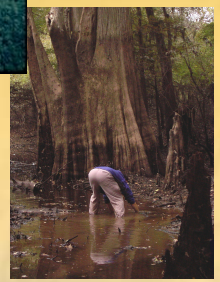
"The Nature Conservancy is one of our most important partners and the *Sustainable Rivers Project*, with its nation-wide focus, is at the forefront of our collaborations."

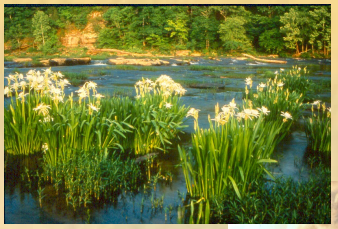
Lt. Gen. Carl A. Strock
Chief of Engineers

Ecologically Sustainable Water Management

Environmental Flows:

The flow of water in a natural river or lake that sustains healthy ecosystems and the goods and services that humans derive from them.





Sustainable Rivers Project

Success through…

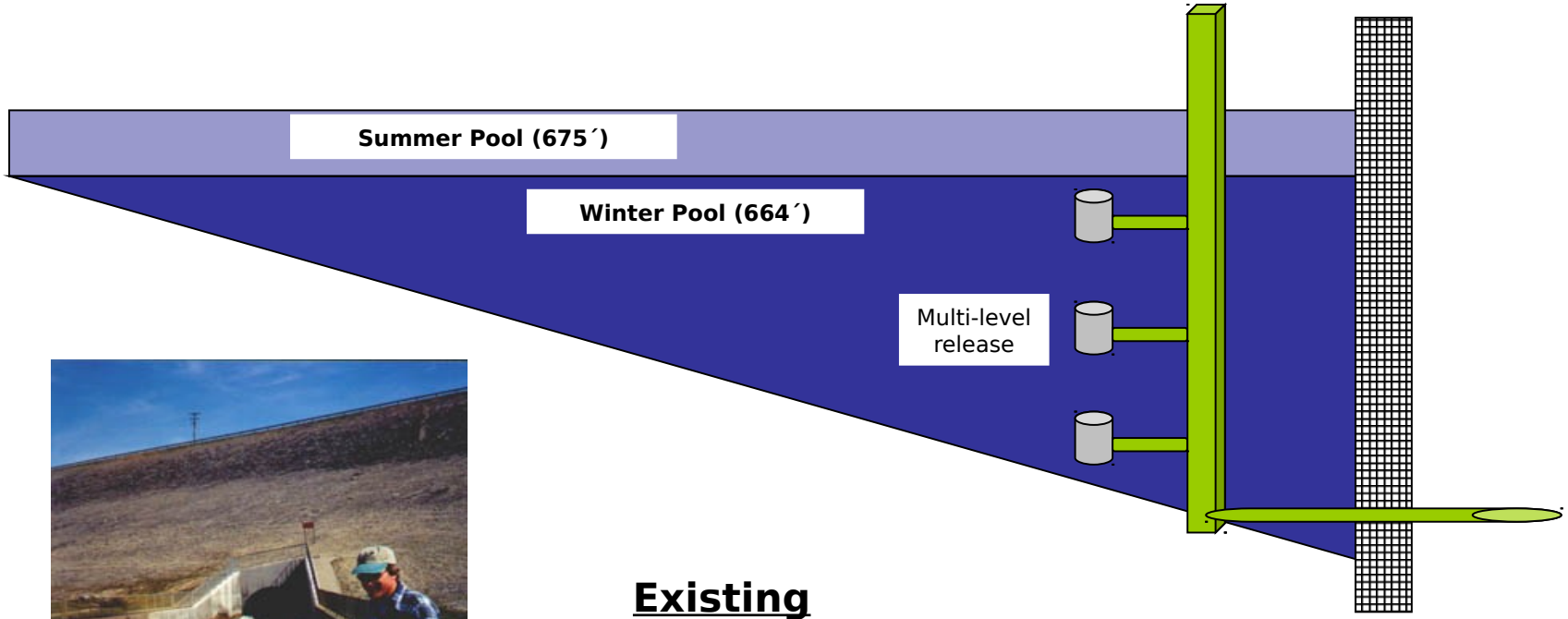
- ➥ **Demonstration Sites** (& export)
- Staff sharing (IPA, internships)
- Training (2 courses/yr @ HEC)
- Joint software development
- Annual meetings
- Coordinated communications and joint publications

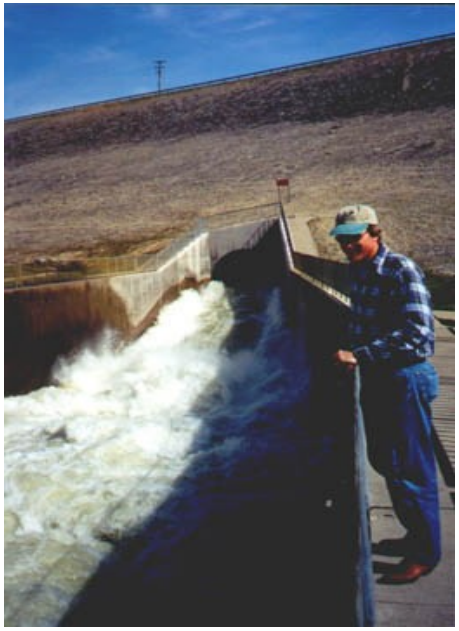
Green River, KY

- 60 species of freshwater mussels
  - 21 imperiled
  - 7 endangered (federal)
- 152 fish species
  - 7 endemic
  - 12 globally rare
- 42 species of troglobites

Green River Dam

(*constructed 1968*)



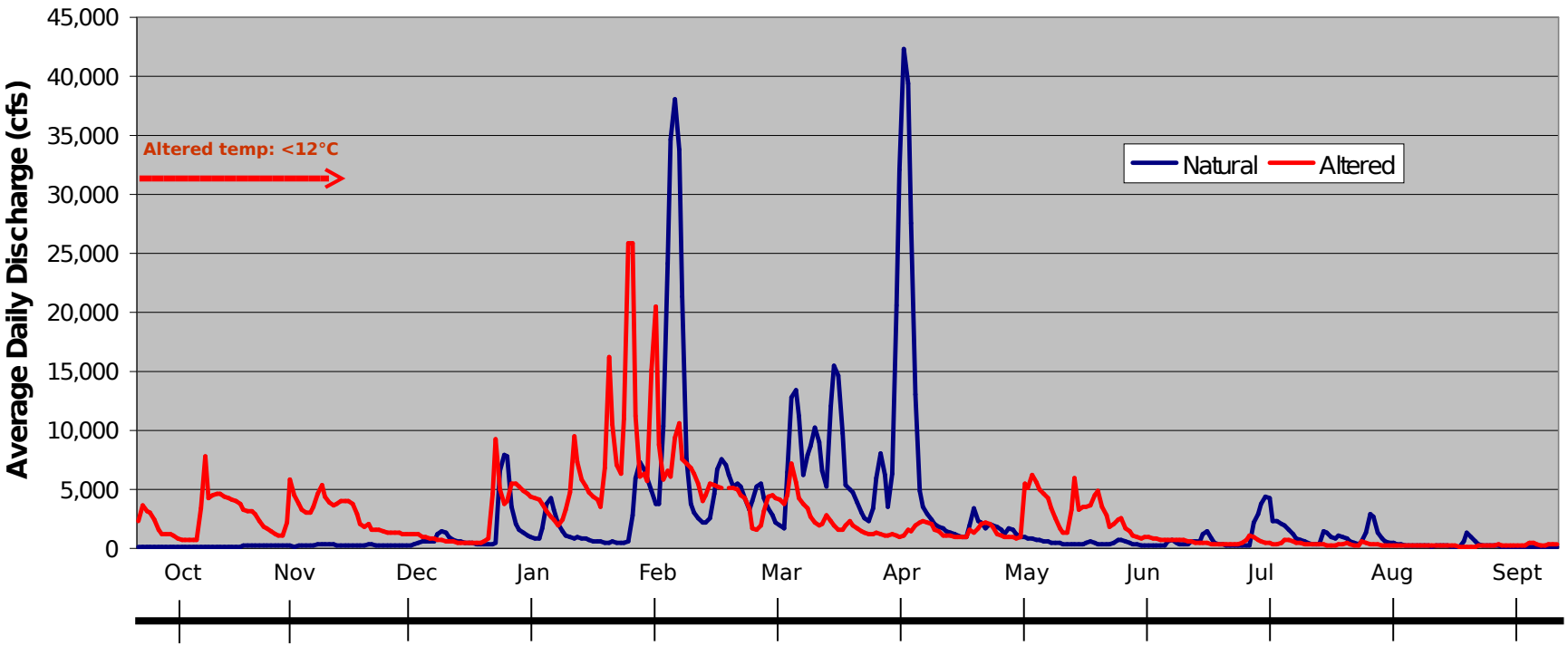


Existing Objectives:

- flood control
- recreation
- water supply
- water quality
- low flow
- fish & wildlife

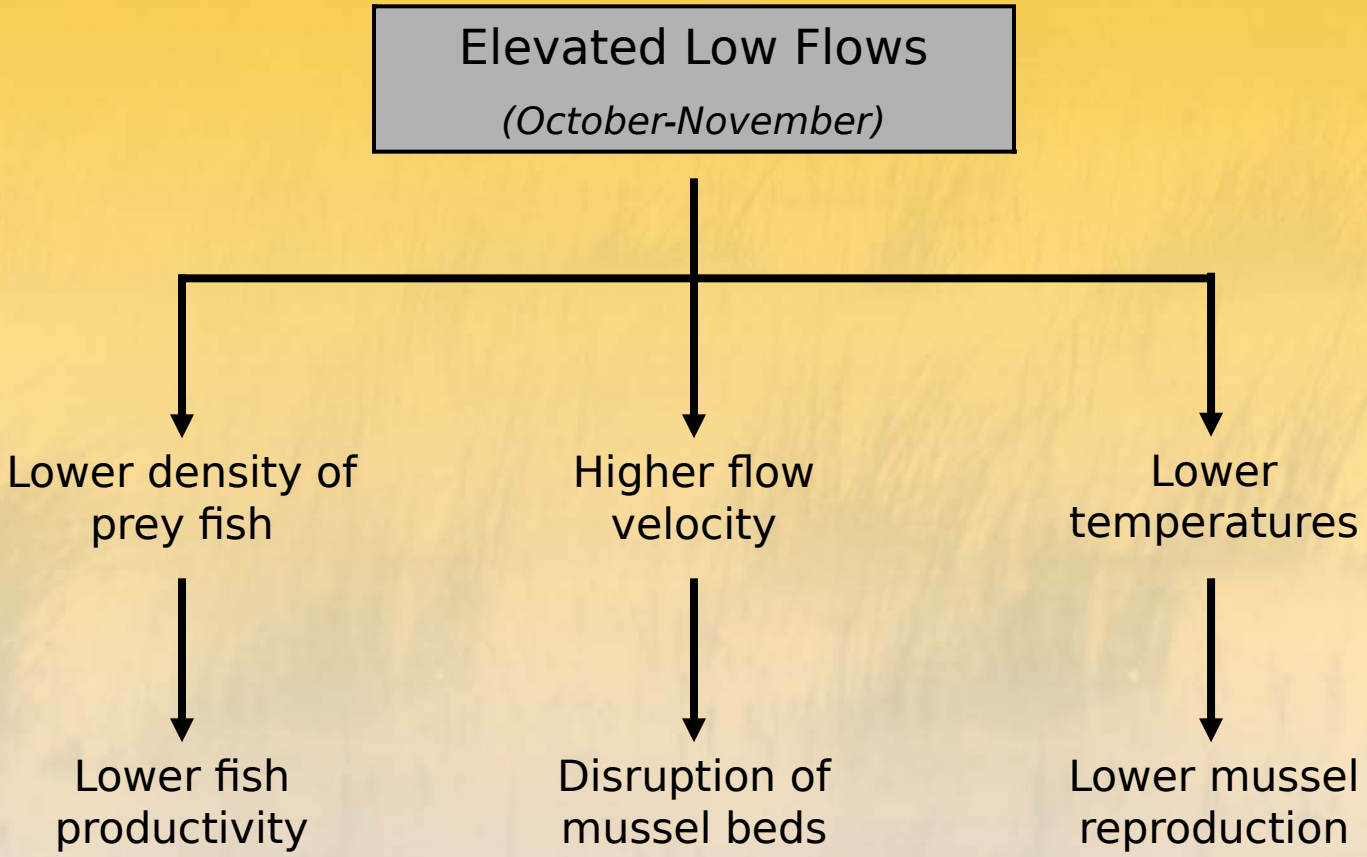
Green River, KY

Example Annual Hydrographs



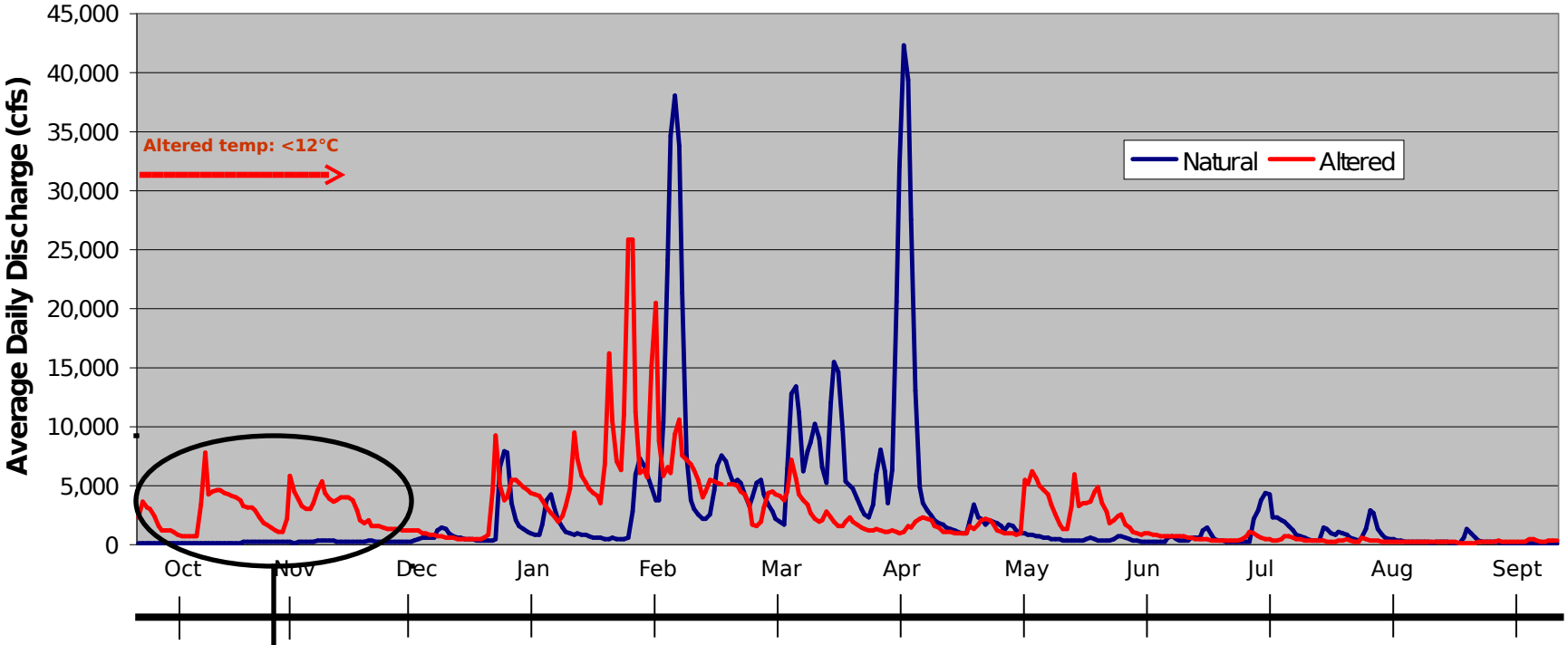
Green River Hypotheses

(from ecological model)



Green River, KY

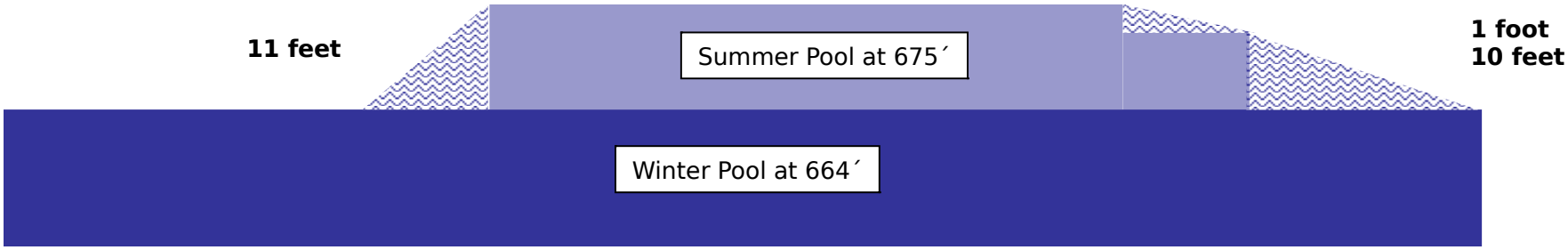
Example Annual Hydrographs



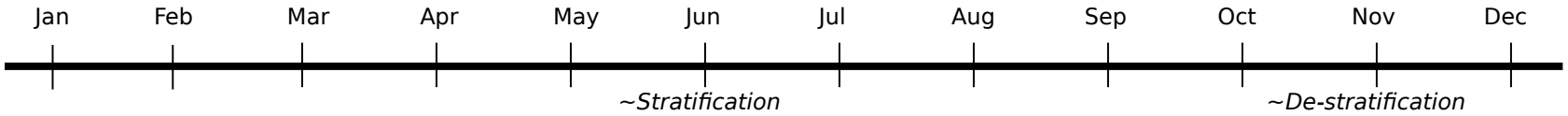
Shift fall releases into Dec to:

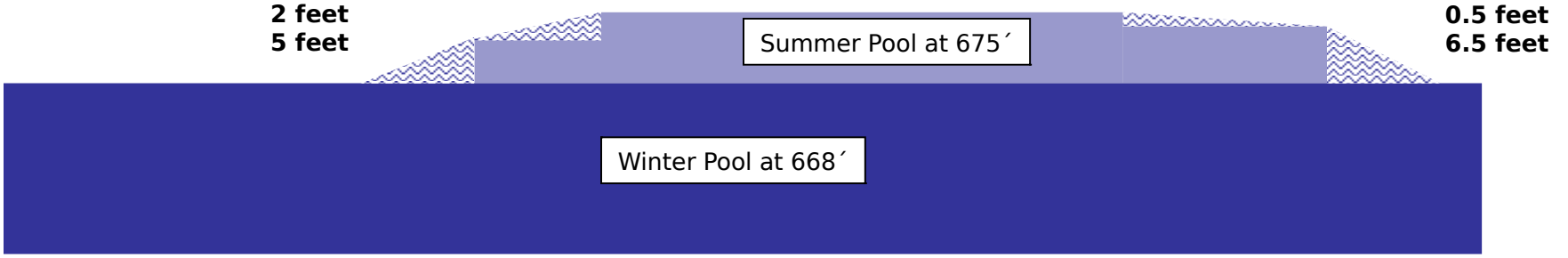
- improve fish and mussel spawning
  - flow/habitat conditions
  - temperature
- concentrate prey species

Re-Operation of the Green River Dam



Initial Operation





Re- Operation

Varied release rates to mimic natural events

Sustainable Rivers Project

Current Sites

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US Army Corps of Engineers ®

Legend

- Sustainable Rivers Project sites
- ACOE Divisions
- ACOE Districts

TNC Freshwater Portfolio Sites Downstream of Army Corps of Engineers Dams

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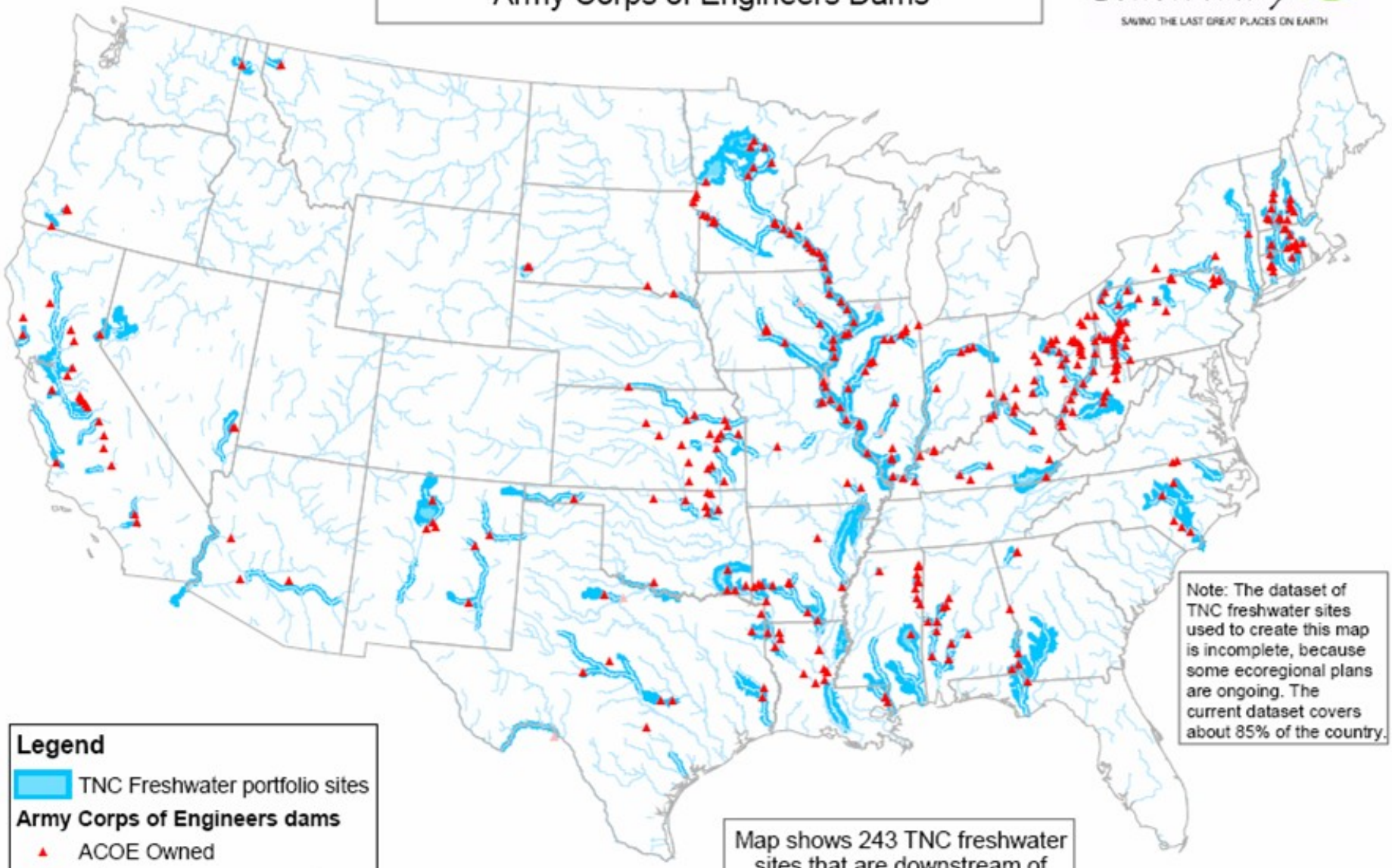


Legend

- TNC Freshwater portfolio sites

Army Corps of Engineers dams

- ACOE Owned
- Other ACOE Involvement
- Rivers and streams

Note: The dataset of TNC freshwater sites used to create this map is incomplete, because some ecoregional plans are ongoing. The current dataset covers about 85% of the country.

Map shows 243 TNC freshwater sites that are downstream of Army Corps of Engineers dams, within 50-100 miles.

Summary: TNC and the Corps

- TNC…Corps' largest non-federal cost share partner on ecosystem restoration
  (number of projects)
- Project types include:
  - adaptive reservoir management
  - stream restoration
  - wetland restoration
  - river-floodplain reconnection
  - shoreline work
  - dam removal
- Sustainable Rivers Program
- Significant overlap between COE facilities and TNC freshwater priority sites

Neversink River Dam Removal

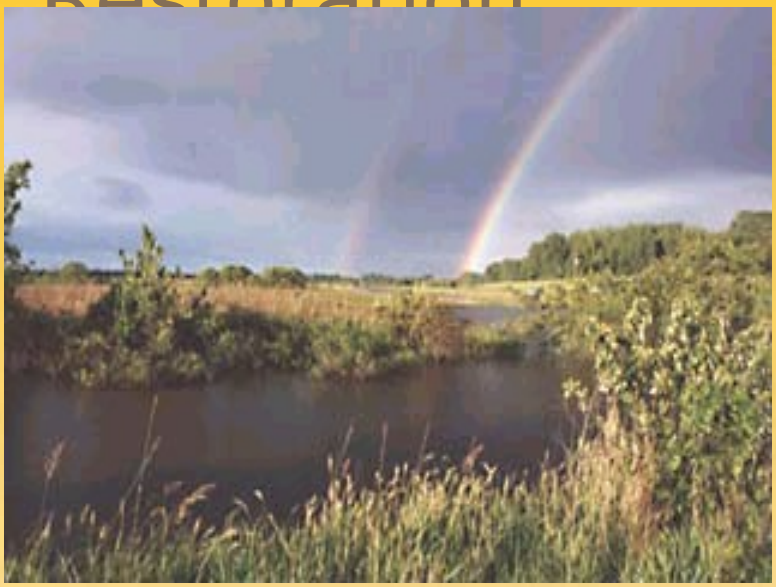
Project Specifics:

- Sec. 206 Aquatic Habitat Restoration
- TNC is non-federal sponsor
- $1.8 million total project cost

Project Purposes:

- Create habitat for endangered dwarf wedgemussels
- Remove physical impediment to shad and other anadramous fish passage

Spunky Bottoms Floodplain Restoration



Project Specifics:

- Sec. 1135 Project
- TNC is non-federal sponsor
- 2,000 acre floodplain restoration
- Total project cost est. $9.3 million

Project Purpose:

- Restore and protect floodplain habitat for terrestrial and aquatic critters -- including state and federally threatened and endangered species
- Provide access to both open river and protected backwaters
- Model project for larger floodplain restoration and reconnection

Savannah River, GA/SC